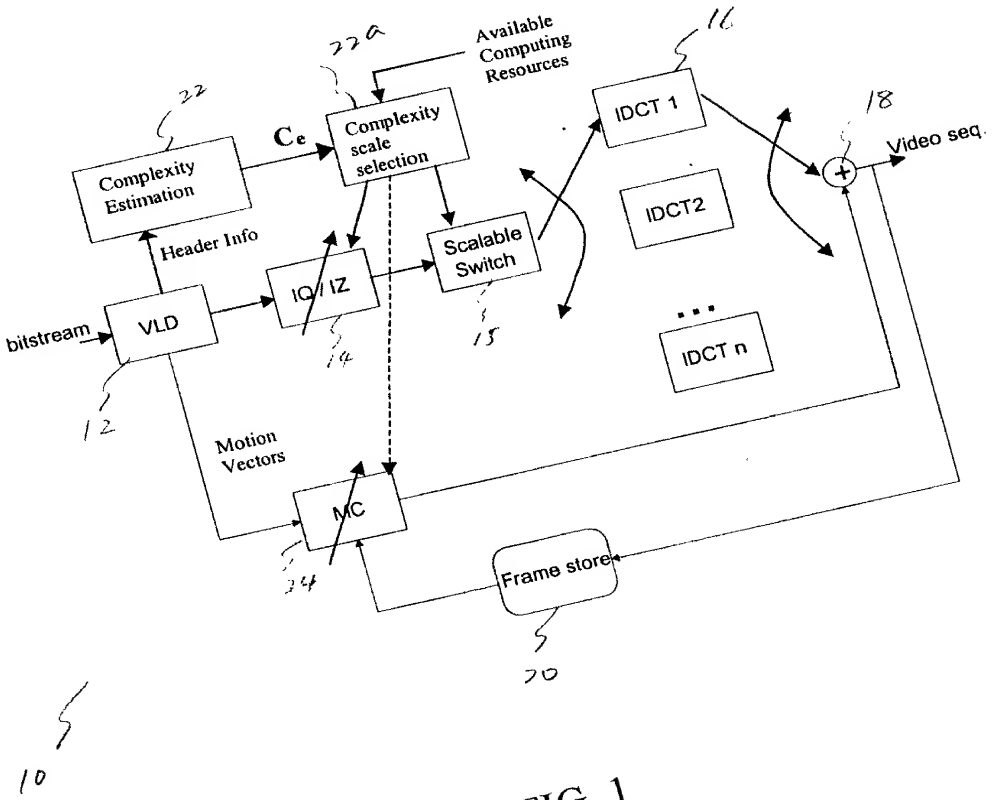
Available Computing Resources
22a
16
22
Ce
Complexity Estimation
Complexity scale selection
IDCT 1
18
Video seq.
IDCT2
Header Info
Scalable Switch
IQ / IZ
bitstream
VLD
IDCT n
12
14
15
Motion Vectors
MC
Frame store
24
20
10

FIG. 1

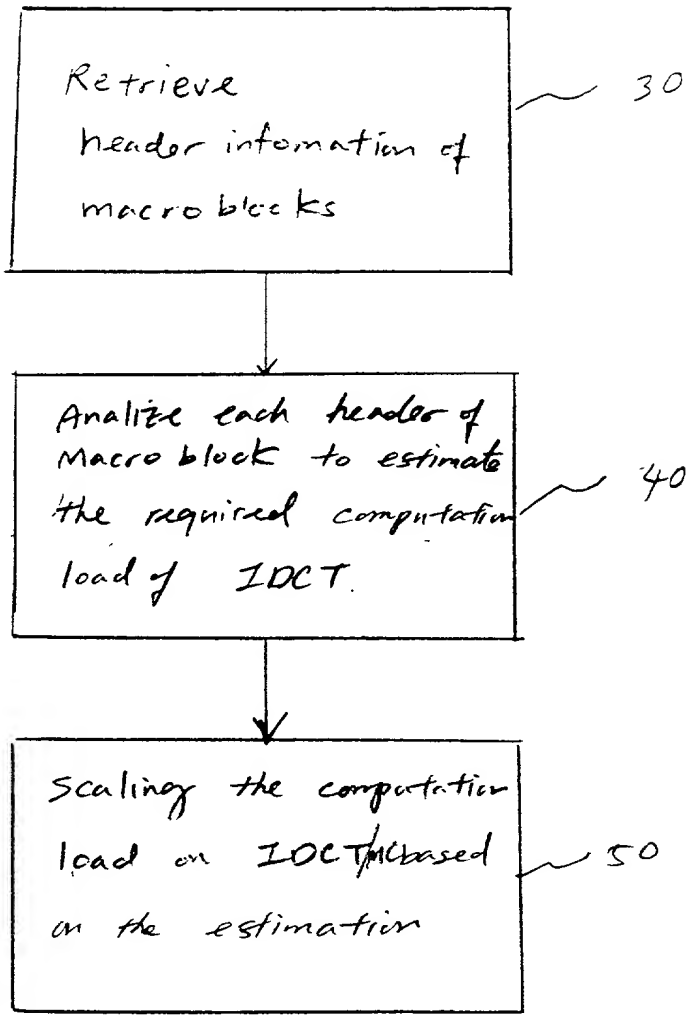
Retrieve header information of macro blocks
30
Analize each header of Macro block to estimate the required computation load of IDCT.
40
Scaling the computation load on IDCT based on the estimation
50

FIG. 2

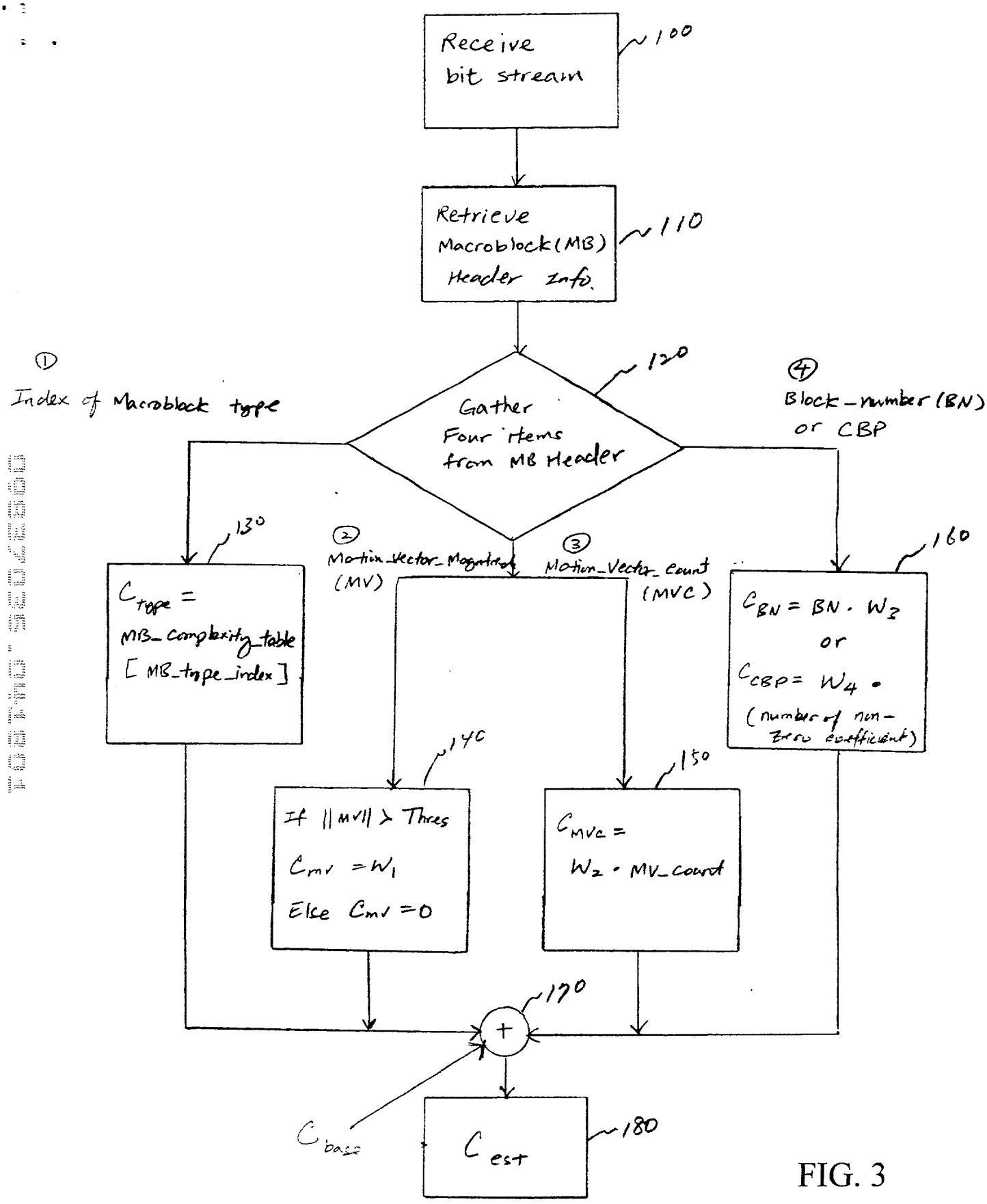
Receive bit stream
100
Retrieve Macroblock(MB) Header info.
110
Gather Four items from MB Header
120
① Index of Macroblock type
② Motion_Vector_Magnitude (MV)
③ Motion_Vector_count (MVC)
④ Block_number (BN) or CBP
C_{type} = MB_complexity_table [MB_type_index]
130
If ||MV|| > Thres
$C_{mv} = W_1$
Else $C_{mv} = 0$
140
$C_{MVC} = W_2 \cdot MV_count$
150
$C_{BN} = BN \cdot W_3$ or $C_{CBP} = W_4 \cdot$ (number of non-zero coefficient)
160
170
C_{base}
C_{est}
180

FIG. 3

FIG. 4(a)

macroblock_ type	macroblock_ quant	macroblock motion_ forward	macroblock motion_ backward	macroblock_ pattern	macroblock_ intra	VLC
Intra					1	1
Intra, macroblock_quant					1	01

FIG. 4(b)

macroblock_ type	macroblock quant	macroblock_ motion_ forward	macroblock motion backward	macroblock_ pattern	macroblock_ intra	VLC
MC_Coded		1		1		1
No MC, Coded				1		01
MC Not Coded		1				001
Intra					1	00011
MC, Coded macroblock_quant	1	1		1		00010
No MC, Coded, macroblock_quant	1			1		00001
Intra, macroblock_quant	1				1	000001

FIG. 4(c)

macroblock_ type	macroblock_ quant	macroblock_ motion forward	macroblock_ motion_ backward	macroblock_ pattern	macroblock_ intra	VLC
MC Interpolated, Not Coded		1	1			10
MC Interpolated, Coded		1	1	1		11
MC Backward, Not Coded			1			010
MC Backward, Coded			1	1		011
MC Forward, Not Coded		1				0010
MC Forward, Coded		1		1		0011
Intra					1	0001 1
MC Interpolated, Coded, macroblock quant	1	1	1	1		0001 0
MC Forward, Coded, macroblock quant	1	1		1		0000 11
MC Backward, Coded macroblock_quant	1		1	1		0000 10
Intra macroblock_quant	1				1	0000 01

Macro Block (MB) complexity Table

MB - Type	MB-type - Index	weight code
Intra	00	0
Not MC, coded	01	W
MC, Not coded	10	2W
MC, coded	11	3W

FIG. 5

Document Received

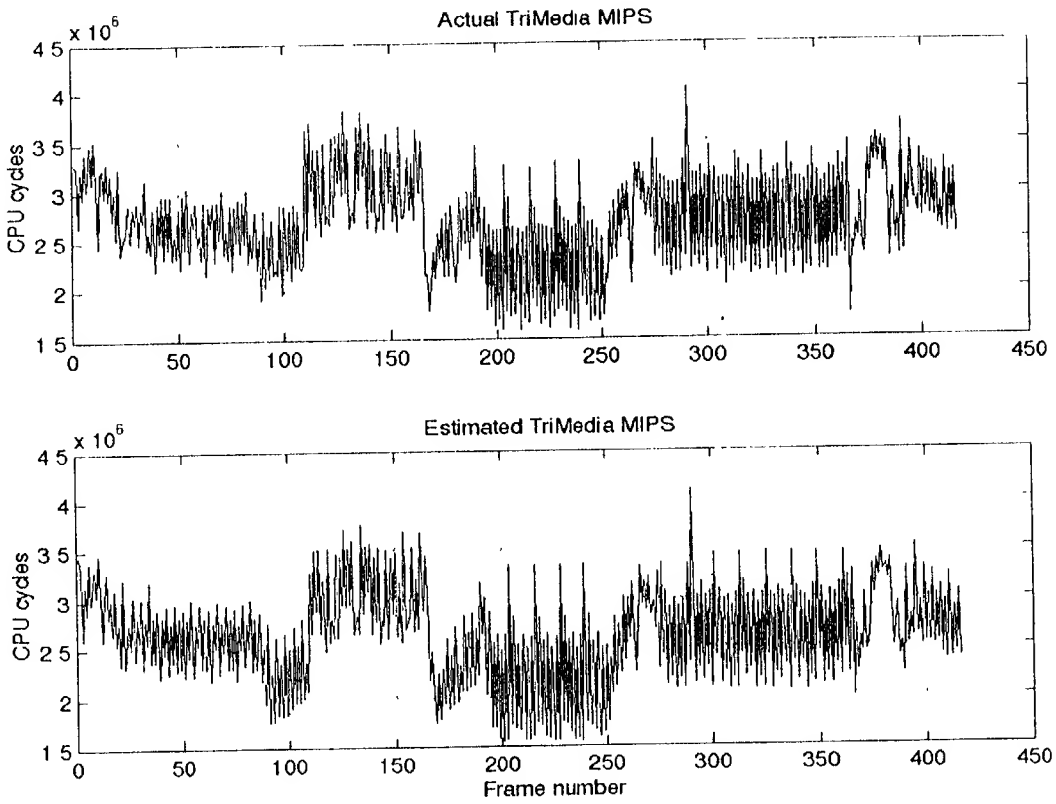

FIG. 6(a)

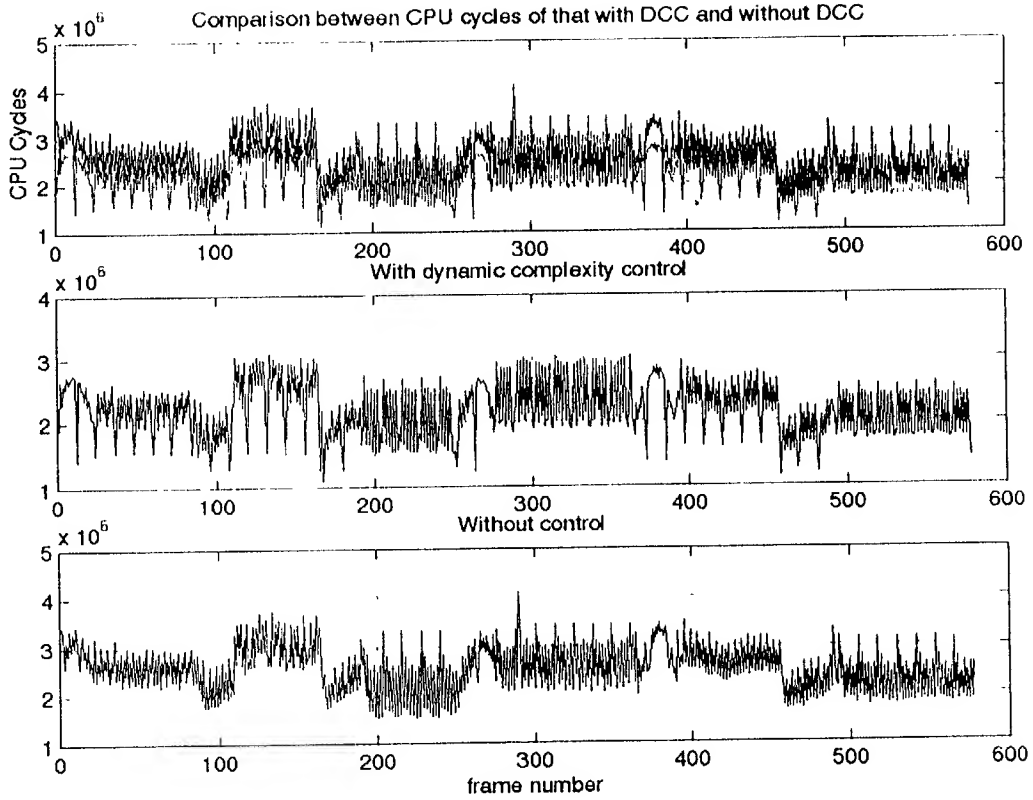
Comparison between CPU cycles of that with DCC and without DCC
x 10^6
CPU Cycles
With dynamic complexity control
Without control
frame number

FIG 6(b)